REMARKS/ARGUMENTS

The Applicants thank the Examiner and Supervisory Examiner for the telephonic interview, which took place on October 28, 2004. During the interview, Examiner Lanier and Supervisory Examiner Barron asked for a "... brief summary of the invention and discussed a proposed amendment to the claims that would further detail the watermarking process by adding positive step limitations to the claims that outline how the watermark signal is embedded into the content signal ..." Interview Summary, dated November 10, 2004 (emphasis added). The Interview Summary incorrectly recites a "watermark key", instead of a "digital watermark", as agreed in the Interview. **Applicants respectfully request confirmation that the term "digital watermark" was agreed.**

Claim 16, as discussed during the interview, is Preliminarily Amended above, and recited here:

"A method of [generating a random key for] applying a digital watermark to a content signal with a plurality of functions, including the input of at least a random key and a digital watermark the method comprising the steps of:

(1) providing a random key generated by the following steps:

(a) generating a random sequence of binary numbers; and

(b) generating information describing the application of the random sequence to the content signal, wherein the information comprises a sample window size, a signal encoding level, and at least one of the following two groups: time delimiters describing segments of the content signal; frequency delimiters describing frequency bands of the content signal;

(2) providing a digital watermark to be embedded; and

(3) embedding the digital watermark using at least the random key and the plurality of functions to produce a uniquely watermarked content signal.

As discussed during the interview, Rhoads describes one input while the Applicants' claim limitation includes at least two inputs, namely "a random key" and "a digital watermark". This significant difference over Rhoads was acknowledged by the Examiner during the Interview. It also demonstrates that the Applicants' invention is patentable over Rhoads and the additional cited references.

Prior Asserted Rejections under 35 U.S.C. § 102

§ 102 Rejections based on U.S. Patent 5,748,783 ("Rhoads")

Claims 16-22, 25-29, 31-40, 42, 43, 45-52, 59-64, 66-86 stand rejected as allegedly anticipated by U.S. Patent No. 5,748,783 issued to Rhoads (thereafter "Rhoads"). See Page 4 of the August 23, 2004 Office Action.

Claims 16-20, 22, 25, 27, 31, 33, 34, 37, 38, 42, 43, 45-52, 59, 62-64, and 66-86

In order for a reference to anticipate a claim, the reference must disclose each and every limitation of the claimed invention, either expressly or inherently, such that a person of ordinary skill in the art could practice the invention without undue experimentation. See Atlas Powder Co. v. Ireco Inc., 190 F.3d 1342, 1347, 51 USPQ2d 1943, 1947 (Fed. Cir. 1999); In re Paulsen, 30 F.3d 1475, 1479, 31 USPQ2d 1671, 1673 (Fed. Cir. 1994). Newly Amended Independent Claim 16 [emphasis added] recites, "**A method of applying a digital watermark to a content signal with a *plurality of functions*, including the input of *at least a random key and a digital watermark***, the method comprising the steps of: **(1) *providing a random key*** generated by the following steps: (a) generating a random sequence of binary numbers; and (b) generating information describing the application of the random sequence to the content signal, wherein the information comprises a sample window size, a signal encoding level, and at least one of the following two groups: time delimiters describing segments of the content signal; frequency delimiters describing frequency bands of the content signal. **(2) *providing a digital watermark* to be embedded; and (3) *embedding the digital watermark using at least the random key and the plurality of functions to produce a uniquely watermarked content signal.***" The Section 102 rejection of Claim 16 is improper for at least the reason that Rhoads fails to disclose a "plurality of functions." Second, Independent Claim 16 (and all claims depending therefrom) requires at least two inputs, absent in Rhoads: (1) "providing a random key"; (2) "providing a digital watermark" and (3) "embedding the digital watermark using at least the random key and the plurality of functions to produce a uniquely watermarked content signal", and, for this additional reason, the 102 rejection should be withdrawn.

The Examiner asserts that "... Rhoads discloses a method for robust information coding wherein several random digital signals are generated to be (Fig. 2) embedded into an input source signal that could be an image, or video to produce a watermarked signal (Abstract), which meets the limitations generating a random sequence of binary numbers for applying a digital watermark to a content signal," August 23, 2004 Office Action at Page 2 and 4. The Applicants respectfully disagree. First, Rhoads describes equivalences between "signature codes", "invisible signatures", and "signatures" reciting that they "... often refer specifically to the composite embedded code signal as described early on in this disclosure," Rhoads at Col. 37 ll. 30-36. These may *arguably* relate to "a random sequence of binary numbers" but not to "a random key" as required by the claim

limitations. Second, it appears that the alleged "random sequence" of Rhoads is not based on a "plurality of functions", as required in the claimed invention[s], but instead are based on the "signature codes", "invisible signatures", "signatures", or "composite embedded code signal" he recites as being equivalent terms. Rhoads, thus, teaches away from generating "a random key" which is "unique", difficult, or computationally infeasible to guess—thus enabling content owners to separately store their original unwatermarked signals without having to expose them again. Third, the Applicants' invention enables computationally-beneficial improvements including replacement of "random keys" offering an efficient and more secure means for maintaining the security of the "uniquely watermarked content signals"-- a significant improvement over Rhoads. More on these significant features are discussed below.

Rhoads teaches away from "a random key" by requiring "[t]he original signal, the N-bit identification word, and all N individual embedded code signals are then stored away in a secured place" Rhoads at Col. 5 ll. 10-13; Figure 3; and, Col. 8 ll. 41-67 – Col. 9 ll. 1-62. As a means of securing a digital signal the requirement of at least comparing the original for purposes of detection or decoding, as Rhoads discloses, is wasteful from a computational perspective and, in effect, significantly undermines any supposed security. One of ordinary skill in the art can readily appreciate that the need to distribute the original signal (necessary for Rhoads' comparison step) exposes the unwatermarked data to the risk of copying. Practically speaking, why copy a modified signal if you can obtain access to the original signal? This is why the Applicant's invention offers a significant advantage over the alleged security taught by Rhoads.

Next, Rhoads' single input embedding function does not represent a "plurality of functions, including the input of at least a random key and a digital watermark," as required in the Applicants' claimed invention[s]. Thus, Rhoads' "N-bit identification word" cannot authenticate or provide integrity of the "identification coded output signal" of Rhoads, absent a comparison with the original. A related problem results from Rhoads' alleged "random sequence" being embedded in the content signal. Thus, the Examiner's assertion that, "Rhoads uses these random digital signals as a 'key'" logically results in non-recovery or even erasure of Rhoads' "key" (more detail on "random keys" is discussed below). Addressing this deficiency, Rhoads discloses: "[a]t step 9, FIG. 3, if we were to subtract the 'original' with its embedded code, we would obviously be 'erasing' the code as well since the code is an integral part of the original. Fortunately, remedies do exist and identifications can still be made. However, it will be a challenge to artisans who refine this embodiment to have the signal to noise ratio of the identification process in the pre-exposed negative case approach the signal to noise ratio of the case where the un-encoded original exists," Rhoads at Col. 12 ll. 57-65.

Last, teaching away from "random keys" and "keyed-algorithms", in general, Rhoads defines a function that takes an input and generates a deterministic output. In contrast, the Applicants' invention represents a keyed algorithm. One of ordinary skill in the art can readily appreciate that a keyed algorithm defines a family or "plurality of functions" with the specific member or element of the family identified is a randomly chosen key from the key space, a key with sufficient entropy— "a random key." Unlike Rhoads, the Applicants' method is a function *when at least two inputs are specified* – "a random key" *and* "a digital watermark". What results is: "[a] method of applying a digital watermark to a content signal with a plurality of functions, including the input of at least a random key and a digital watermark ... to produce a uniquely watermarked content signal." Rhoads fails to disclose all of the elements of the claimed invention, thus, Claim 16 (and all claims that depend therefrom) is patentable over Rhoads. For these additional reasons the section 102 rejections of Claim 16 (and all claims depending therefrom) based on Rhoads should be withdrawn.

Newly Amended Independent Claim 34 discloses (1) "providing a random key generated by the following steps: (a) generating a random or pseudo-random sequence of binary numbers; (b) associating with the random or pseudo random sequence, one or more references to encoding functions for encoding at least one watermark into a content signal; and (2) providing at least one watermark to be embedded into a content signal; and (3) embedding the digital watermark using at least the random key and the plurality of functions to produce a unique content signal." As argued above, Rhoads' alleged "N random signals" has no comparable functionality: it is arguably a "N-bit identification word", used as a single input, not a "random key" as is commonly understood to one readily skilled in the art. The section 102 rejection is improper because Rhoads does not disclose at least two inputs "including at least a random key and a digital watermark." Rhoads' "N random signals" do not include the additional steps of associating the Applicants' generated random key with references to "encoding functions" and subsequent "embedding" based on these "reference[d] encoding functions". Rhoads teaches away from associating the "random key" (he does not disclose a "random key") with the encoding functions instead relying on the original to recover and identify Rhoads' content signal—though recovery may not be possible as argued previously. Rhoads' use of a single input fails to disclose both of the Applicants' inputs: "a random key" and "a digital watermark" as well as the claim limitation, "associating with the random or pseudo random sequence, one or more references to encoding functions for encoding at least one watermark into a content signal". For these reasons, Claim 34 (and all claims that depend therefrom) is patentable over Rhoads.

Newly Amended Independent Claim 47 discloses: "embedding a plurality of digital watermarks into a content signal with a plurality of functions" based on the steps of (1) "providing a random key generated by the following steps: (a) generating a random or pseudo-random sequence of binary numbers for each of

the plurality of digital watermarks to be embedded; (b) associating each of the random or pseudo random sequences with one or more references to encoding functions for encoding watermarks into a content signal, and with each of the plurality of digital watermarks to be embedded"; and (2) "providing each of a plurality of digital watermarks to be embedded into the content signal using the referenced encoding functions associated with the respective digital watermark." Claim 47 is patentable over Rhoads for at least the reasons discussed above in connection with Claim 16 and Claim 34. Claim 47 (and all claims depending therefrom) is patentable over Rhoads for the additional reason that Rhoads does not teach the use of multiple watermarks governed by separate "random keys" that depend on "a plurality of functions" with at least two inputs—"a random key" *and* "a digital watermark". This further distinction is respectfully submitted in connection with the Examiner's assertion in the August 23, 2004 Office Action at Page 3 and 4.

Multiple watermarks governed by a plurality of "random keys" provide significant benefits over Rhoads. First, it increases security by allowing multiple watermarks to be governed by "a plurality of functions", for instance, encoding functions of differing complexity, encoding functions mutually independent from each other, and combinations of encoding functions. Second, different parties may have different access via separate "random keys" based on distribution arrangements and the like. Because Rhoads fails to disclose all of the claim limitations: "embedding a plurality of digital watermarks into a content signal with a plurality of functions", based on inputs of at least "a random key" and "a digital watermark", the section 102 rejection of Claim 47 (and all claims that depend therefrom) should be withdrawn.

Newly Amended Independent Claim 59, and all claims that depend therefrom, address devices including the following elements: (1) "a random key generator to generate at least one random key"; (2) "a function generator which is capable of generating a plurality of encoding functions"; and, (3) "an association device to associate one of said at least one random key with at least one of said plurality of encoding functions and with a watermark generated by the watermark generator." As argued above, Rhoads' alleged "N random signals" is arguably a "N-bit identification word" not "a random key". The section 102 rejection is improper because Rhoads does not disclose "a random key generator" to "associate one of said at least one random key with at least one of said plurality of encoding functions and with a watermark generated by the watermark generator." For at least the reasons discussed above in connection with Claims 16 and 34, Claim 59 is allowable. Rhoads teaches away from associating the "random key" with "one of said plurality of encoding functions". Instead, the use of a single input, Rhoads' "N-bit identification word", not "a random key" and "a watermark", as per the claim limitations of the Applicants, results in Rhoads relying instead on the original unencoded signal for detection or decoding of his "N-bit identification word". For these additional reasons, Claim

59 (and all claims that depend therefrom) is patentable over Rhoads. Thus, the section 102 rejection of Claim 59 (and all claims that depend therefrom) should be withdrawn.

Independent Claim 70, and all claims that depend therefrom, requires at least the following steps absent in Rhoads: (1) "a watermarking key generator which generates a watermarking key using a sequence of random binary numbers generated by the random number generator and using input from the function generator" and (2) "an encoding device to encode a watermark generated by the watermark generator into the content signal using a watermarking key generated by the watermarking key generator." The 102 rejection is improper for at least the reason that Rhoads does not disclose either "a watermarking key generator" or "a watermarking key". Using "watermarking keys", based on at least the following inputs, the "sequence of random binary numbers" and "the function generator" "capable of generating a plurality of functions" as required by the claim elements, has significant benefits over Rhoads, and enables individual content owners to generate and maintain their own "watermarking keys" to uniquely protect their own content signals. Rhoads' alleged "random sequence" is not coupled to a "function generator"-- nor does Rhoads disclose "watermarking" in connection with "key generation".

As disclosed previously, Rhoads relies on distribution of "[t]he original signal, the N-bit identification word, and all N individual embedded code signals are then stored away in a secured place" Rhoads at Col. 5 ll. 10-13; Figure 3; and, Col. 8 ll. 41-67 – Col. 9 ll. 1-62, teaching away from generating a "watermarking key". No industry standardization, as argued by Rhoads, is necessary with the Applicants' invention. Rhoads at Col. 11 ll. 1-8: "[t]he fullest expression of the present system will come when it becomes an industry standard and numerous independent groups set up with their own means or `in-house` brand of applying embedded identification numbers and in their decipherment. Numerous independent group identification will further enhance the ultimate objectivity of the method, thereby enhancing its appeal as an industry standard." That Rhoads relies on a single input to generate an output signal limited by the single input undermines any supposed security as argued previously. Thus, Claim 70 is allowable over Rhoads for at least the reasons discussed in connection with Claims 16, 34 and 59. Claim 70 is allowable over Rhoads for the additional reason that Rhoads fails to disclose "a watermarking key generator" in accordance with the claim limitations of Claim 70. Thus, the section 102 rejection of Claim 70 (and all claims that depend therefrom) should be withdrawn.

Independent Claim 79, and all claims that depend therefrom, requires at least "a digital watermark encoder" and "a digital watermark decoder", as part of the claim elements. This is noticeably absent from Rhoads as he advocates use of at least the original signal to be used for detection and decoding of "N-bit

identification word[s]", argued previously. For at least this reason, the 102 rejection based on Rhoads is improper. Unlike Rhoads, the Applicants' claim elements include: (1) "a watermarking key that encodes a watermark into a content signal using a random or pseudo-random binary sequence" and (2) "an encode and decode pair associated with the watermarking key." Again, Rhoads fails to disclose a "watermarking key" that has an "associated encode and decode pair". The Applicants' invention represents a significant improvement over Rhoads including key management for the "watermarking key" as there would be "an encode and decode pair", as required by the claim language, for which encoders and decoders could be logically separated. Rhoads discloses no such features. For at least these reasons the 102 rejection is improper. Claim 79 is patentable over Rhoads for this additional reason that Rhoads fails to disclose "an encode and decode key pair associated with the watermarking key" in accordance with the limitations of Claim 79. Thus, the section 102 rejection of Claim 79 (and all claims that depend therefrom) should be withdrawn.

For at least the reasons discussed above, Claims 16-22, 25-29, 31-40, 42, 43, 45-52, 59-64, 66-86 are patentable over Rhoads. Applicants request that the Examiner withdraw the 102 rejections for Claims 16-22, 25-29, 31-40, 42, 43, 45-52, 59-64, 66-86.

Arguments directed to selected dependent claims

Additional reasons why certain dependent claims are allowable are recited below.

Claim 21

Applicants respectfully disagree with the Examiner's assertion that "... Rhoads discloses that the embedding system can be used for photographs, images, video, film, and other forms of video imagery (Col. 1, lines 12-19)...", Office Action August 23, 2004 at Page 3 (Claim 21 depends from Claim 16). Claim 21 has the additional claim limitations (1) "providing at least two sample streams of the content signal for selection"; (2) "selecting one of said at least two sample streams of the content signal." These steps rely on "a random key" for which a second input, " a digital watermark", is used to "uniquely watermark" the content signal. The 102 rejection is improper for at least the reason that Rhoads fails to disclose "a random key". Rhoads is dependent on a single input and single output teaching away from sample stream selection based on "a random key." Rhoads discloses: "[t]he addition or subtraction of the scaled noise signal in accordance with the bits of the code word effects a modulation of the input signal which is generally imperceptible" Rhoads at Col. 16 ll. 40-42.

Moreover, multiple content streams do not appear to be contemplated by Rhoads. Providing multiple input streams for which multiple "watermark keys" or

"random keys" can be associated is absent in Rhoads' disclosure. The improvements in Claim 21, for instance, enable encoding of audio and video streams in a multimedia content signal based on "a plurality of functions" that are specific to audio and video coding schemes, respectively. It would also enable watermarking based on "random keys" with a hierarchy for different distribution schemes or access by different entities in a variety of distribution scenarios. One party may own rights only to the audio stream of a multimedia work, for instance. In these cases, a separate random key could be provided to that rights owner for which the "selected sample stream" is relevant. Rhoads fails to disclose "a plurality of functions, including the input of at least a random key and a digital watermark" from which "one of said at least two sample streams of the content signal" is uniquely watermarked, as required in Claim 21. For these additional reasons, Claim 21 is patentable over Rhoads. Applicants request that the Examiner withdraw the Section 102 rejection of Claim 21.

Claim 32

Applicants respectfully disagree with the Examiner's prior assertion that "... Rhoads discloses being able to locate the watermark information signal in the content signal and verify the watermark information as the very information that was embedded earlier (Col. 8, line, 42 – Col. 9, line 62)." Claim 32 depends from Claim 31, which depends from Claim 16. Claim 16's enabling steps, include: (1) "providing a random key"; (2) "generating information describing the application of the random sequence to the content signal"; and, (3) "providing a digital watermark to be embedded" instead, Rhoads relies on the single input--- the "N-bit identification word." The 102 rejection is improper for at least the reasons that Rhoads fails to disclose either: (1) "generating a watermark information signal comprising watermark synchronization information to help locate a watermark in the content signal and information to help assess the validity of said watermark" or (2) "placing the watermark information signal within the content signal so as to not interfere with any digital watermarks embedded in the content signal." **Applicants respectfully request clarification of Examiner's argument in the August 23, 2004 Office Action at Page 3 and 4.**

By not interfering with "any digital watermarks embedded in the content signal", the Applicants' "watermark information signal" is able to assist with assessing "validity" of "digital watermarks". In contrast, Rhoads relies on an "original signal" for a comparison step (e.g., Figure 3). Unlike the Applicants' "watermark information signal", Rhoads' "calibration sequence" *is part of* his alleged "embedded signal"-- "... each N-bit identification word begins with the sequence of values '0101'...." Rhoads at Col. 4 ll. 19-21. Thus, Rhoads' "calibration sequence" teaches away from "watermark information signal[s]" as taught by the Applicants. Rhoads' approach may result in erasure of his embedded signal, as argued previously, and without the original signal, Rhoads' technique cannot independently authenticate the suspect content signal. But, as

argued above, one of ordinary skill in the art can readily appreciate that the need to distribute the original signal (necessary for Rhoads' comparison step) exposes the unwatermarked data to the risk of copying. Practically speaking, why copy a modified signal if you can obtain access to the original signal? This is why the Applicant's invention offers a significant advantage over the alleged security taught by Rhoads. Because of the above recited claim limitations, Claim 32 is patentable over Rhoads. For these reasons, Claim 32 should be allowed. Applicants request that the Examiner withdraw the Section 102 rejection of Claim 32.

Claims 35, 36 and 39

Applicants respectfully disagree with the Examiner's assertion that "... Rhoads discloses that the identification codes used in the data includes information that identifies the scanner and creativity software used with the data (Col. 22, lines 52-60)" August 23, 2004 Office Action at Page 4. This does not meet the limitations of Newly Amended Independent Claim 34, from which Claims 35, 36 and 39 depend, specifically: "A method of embedding a digital watermark into a content signal with a plurality of functions, including the input of at least a random key and a digital watermark, the method comprising the steps of: providing a random key generated by the following steps: generating a random or pseudo-random sequence of binary numbers; associating with the random or pseudo random sequence, one or more references to encoding functions for encoding at least one watermark into a content signal; and providing at least one watermark to be embedded into a content signal using the referenced encoding functions to produce a unique content signal." The 102 rejection is improper for at least the reason that Rhoads fails to disclose "a random key" associated with "referenced encoding functions", as argued previously. Claims 35, 36 and 39 include additional claim limitations where the "references" are functions associated with the "plurality of functions".

Rhoads' allegedly associates his "N-bit identification word" with identifiers, *not* a "plurality of functions" or even "a random key" as disclosed by the Applicants. Rhoads teaches away from references to functions for embedding or decoding by requiring only his "N-bit identification word" for input. "[I]t is desirable in some applications for the N-bit identification word to actually signify names, companies, strange words, messages and the like" Rhoads at Col. 34 ll. 48-50. Specifically, Claim 35 "wherein said one or more references is selected from the group consisting of: integer indices that reference chunks of computer code; alphanumeric strings which name software modules or code resources; and memory addresses of memory locations wherein software programs reside in a computer memory" – improves functionality of the "random key" by associations with software elements including memory; Claim 36 "wherein said one or more references comprise alphanumeric strings which identify software modules that can be used to embed a watermark into a content signal" – improves security by

adding a reference step to include a "software module" for embedding functionality; and, Claim 39 "wherein said one or more decoding references comprise alphanumeric strings which identify software modules that can be used to extract a watermark from a content signal" – adds the step for referencing "decoding" functions from the "plurality of functions" that may be stored in a "software module". Rhoads' alleged "embedded signal" lacks functionality. Rhoads' "N-bit identification word[s]" are apparently used for identification, alone. The improvements offered by Claims 35, 36 and 39 include optimizing the functionality of the Applicants' "random keys" for both "embedding digital watermarks" and "extracting digital watermarks". Upgradeability with the Applicants' invention[s] also becomes more computationally efficient than the logical requirement, under Rhoads, of having to replace his entire encoding and/or decoding scheme, as well as the "N-bit identification word[s]". These are significant benefits over Rhoads. These claim limitations are also absent in Rhoads. For at least these reasons, Claims 35, 36 and 39 are patentable over Rhoads. Applicants request that the Examiner withdraw the Section 102 rejection of Claims 35, 36 and 39.

Prior Asserted Rejections under 35 U.S.C. § 103

In order to "establish a prima facie case of obviousness, three basic criteria must be met." MPEP § 7.06.02(j). First, there must be some motivation or suggestion to modify the reference or to make the proposed combination. Second, there must be a reasonable expectation of success. "The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on the applicant's disclosure." MPEP § 2142 (citing In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)). Third, the combined references must teach or suggest all claim limitations.

The Examiner has failed to establish a prima facie case of obviousness to the extent that there is no motivation or suggestion to make the proposed combinations of the references as directed by the Examiner. According to the MPEP, [i]n order to support a conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention obvious in light of the teachings of the references. MPEP 2142 (citing Ex parte Clapp, 277 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985)) (emphasis added). Further, "[w]hen the motivation to combine the teachings of the references is not immediately apparent, it is the duty of the examiner to explain why the combination of teachings is proper." MPEP 2142 (citing Ex Parte Skinner, 2 USPQ2d 1788 (Bd. Pat. App. & Inter. 1998)).

The Federal Circuit has recently emphasized the importance of providing evidence of motivation to combine in Winner Int'l Royalty Corp. v. Ching-Rong Wang, 202 F. 3d 1340, 1348-49 (Fed. Cir. Jan. 27, 2000). "Although a reference need not expressly teach that the disclosure contained therein should be combined with another . . . the showing of combinability, in whatever form, must nevertheless be 'clear and particular.'" Winner, 202 F. 3d at 1348-49 (citations omitted). Further, the "absence of such a suggestion to combine is dispositive in an obviousness determination." Gambro Lundia AB v. Baxter Healthcare Corp., 11 F.3d 1573, 1579 (Fed. Cir. 1997).

Applicants submit that the Examiner has not satisfied his initial burden of providing "clear and particular" evidence of motivation to combine for any of the proposed combinations of references. Instead, it appears that the Examiner has simply identified references that allegedly disclose the elements of the claim, and has combined them. Even assuming *arguendo* that the references contained all elements of the claimed invention, it is still impermissible to reject a claim as being obvious simply "by locating references which describe various aspects of a patent applicant's invention without also providing evidence of the motivating force which would impel one skilled in the art to do what the patent applicant has done." Ex parte Levengood, 28 USPQ2d 1300, 1303 (Bd. Pat. App. & Inter. 1993) (emphasis added).

1. a) § 103 Rejections based on Rhoads and Menezes as applied to Claims 23 and 24

Claims 23 and 24 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Rhoads in view of Menezes. The Examiner asserts that "... Menezes discloses generation of a random key using random strings that are hashed and run through a DES algorithm...." August 23, 2004 Office Action at Page 6. Applicants respectfully disagree. Claims 23 and 24 depend from Claim 16. Applicants disclose "a plurality of functions" including (1) "providing a random key" and (2) "providing a digital watermark to be embedded to produce a uniquely watermarked content signal."

First, the combination of Menezes and Rhoads fails to disclose both elements in generating a random key for digital watermark embedding. Claim 16, from which Claims 23 and 24 depend, cites: "(1) providing a random key generated by the following steps: (a) generating a random sequence of binary numbers; and (b) generating information describing the application of the random sequence to the content signal...." The input of "a random key" and "a digital watermark" results in a "uniquely watermarked content signal". The enabling step of "generating information describing the application of the random sequence to the content signal" does not result from the combination of the references. "Random keys", as taught by Menezes and known in the art cryptography, do not imperceptibly change a content signal they produce an encrypted signal.

Assuming, *arguendo*, Menezes taught "random keys" similar to those of the Applicants, the functionality of said "random keys" would be for encryption *not* steganographic encoding based on a "plurality of functions" as required by the claims. Further, neither reference separately or in combination discloses generating the "random key[s]" of the Applicants using "human interactive input", required in Claim 24.

Second, Rhoads teaches generation of an "N-bit identification word", this alleged "random sequence" lacks the functionality of the Applicants' "random keys" as disclosed previously. Neither Menezes, nor the combination of Rhoads with Menezes, discloses this claim element. Menezes' alleged "random key" is directed at encryption, which would render the "N-bit identification word" of Rhoads encrypted. Adding Rhoads would be improper since his "N-bit identification word" is *not* "a random key". The combination teaches that Rhoads with Menezes' "random bit generator" would logically result in a "N-bit identification word" that has "random bits"-- not the two inputs of the Applicants, namely "a random key" and "a digital watermark" to "produce a uniquely watermarked content signal".

Last, there is no motivation to combine these two references as claimed in accordance with the claimed invention. Encryption methods as described by Menezes are not directed at "human interactive input". That Menezes' key generation lacks functionality for applying the random key or "human interactive input" for purposes of steganographic encoding of a content signal, and Rhoads lacks any disclosure of key generation, the result of two different forms of intended security. Menezes' keys do not map data, let alone watermark data, to a content signal, Rhoads does not contemplate keys and teaches away from the use of keys as argued previously, and thus there is no motivation to combine these two references. The Examiner is using the instant invention as a roadmap to combine the references. Applicants therefore request the Examiner withdraw the Section 103 rejections of Claims 23 and 24 (which depend from Claim 16).

2. a) § 103 Rejections based on Rhoads and Koopman as applied to Claims 30, 41, and 65

Claims 30, 41 and 65 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Rhoads in view of Koopman. The Examiner asserts that "... Koopman discloses a random number generation process wherein a random sequence is concatenated with certain values of an incoming signal and subsequently encrypted (Abstract)," August 23, 2004 Office Action at Page 7. Koopman does not disclose concatenation with based on a "plurality of functions" and the two inputs required, "a random key" and "a digital watermark". As argued previously, Rhoads does not teach "a random key" as per the Applicants' disclosure, Rhoads teaches an "N-bit identification word".

First, the combination of Rhoads and Koopman would logically result in encrypting the "N-bit identification word". Rhoads and Koopman would not result in "encrypting a concatenated string" including "a random key" generated by "the random sequence" and the "generated information" (of Claims 30, 41, and 65). Applicants' disclosure is directed at securing "a random key" *after it has been used to watermark* a "content signal". This combinatorial step increases the security of the Applicants' "random key[s]". That Rhoads, as has been argued previously, does not rely on "random keys" for detection or decoding, instead requiring at least the "original signal" and "N-bit identification word", limits combinations of Rhoads with Koopman to the claim limitations for at least the reason that the "original signal", not a "random key", is relied upon for detection or decoding. Securing the "concatenated string" of Applicants' Claims 30, 41, 65, would thus not logically follow under the combination of Rhoads and Koopman.

Second, as with combinations of Rhoads with Menezes, argued previously, combining Rhoads with Koopman's "random number generation" process results in an encrypted "key word which is transmitted with the fob ID," Koopman at Abstract. As per Koopman, encrypting the alleged "random sequence" of Rhoads would apparently result in an encrypted "N-bit identification word". The Applicants' "random key" is generated with a "random sequence of binary numbers" and "information describing the application of the random sequence to the content signal" (Claim 16 from which Claim 30 depends); "generating a random or pseudo-random sequence of binary numbers" and "associating with the random or pseudo random sequence, one or more references to encoding functions for encoding at least one watermark into a content signal" (Claim 34 from which Claim 41 depends); and, "an association device to associate one of said at least one random key with at least one of said plurality of encoding functions and with a watermark generated by the watermark generator" (Claim 59 from which Claim 65 depends). Rhoads fails to disclose "a random key" and "a digital watermark" as two inputs for encoding. By extension, associations between the elements to generate the "random key" with "encoding functions" cannot logically result from the combination of Rhoads and Koopman. Rhoads' alleged "random sequence" is not functionally equivalent with the Applicants' "random key", as such, the combination of Rhoads and Koopman cannot anticipate Claims 30, 41, and 65.

There is no motivation to combine these two references as claimed in accordance with the claimed invention. Encryption methods as described by Koopman are not directed at steganographic encoding based on "random keys". That Koopman's encrypted "key word" may act very similarly to Rhoads' "random sequence"— both apparently IDs lacking any functionality as per the Applicants' "random key" in the claimed invention[s] – logically results in the description of two random sequences. Neither reference discloses "random keys" that encode data, let alone watermark data, into a content signal and thus there is no motivation to combine these two references. The Examiner is using the instant

invention as a roadmap to combine the references. Applicants therefore request the Examiner withdraw the Section 103 rejections of Claims 30, 41, and 65 (which depend from Claim 16, 34, and 59 respectively).

Conclusion

Applicant maintains that this application is in condition for allowance, and such disposition is earnestly solicited.

It is believed that no other fees are required to ensure entry and consideration of this response.

Respectfully submitted,

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